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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,221	09/05/2003	Yun Bok Lee	0465-1023P	6996
2292	7590	02/11/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/655,221	LEE ET AL.	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-17, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 6 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 2, 8, 11 and 19 are objected to because of the following informalities:

Claims 2 and 8 recite "a thin film transistor, a passivation layer and a pixel electrode between the insulating layer and the first alignment layer" and "a thin film transistor between the first substrate and the color filter layer"; claims 11 and 19 recite "forming a thin film transistor on the insulating layer of the first substrate before forming the first alignment layer" and "forming a thin film transistor between the first substrate and the color filter layer". However, the figures do not show any specific drawings of the location of the thin film transistor. The specification only described the passivation layer (not shown) is formed on the entire surface of the insulating layer (34) including the TFT (paragraphs 0042, 0050). Therefore, the thin film transistor should be formed between the first substrate and the color filter. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 5, 7-10, 11, 13-14, 16 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,650,390 (Sakamoto et al) in view of US 6,822,723 (Song et al).

Claims 1 and 10, Sakamoto discloses (col.6, line 24 – col.7, line 19; Fig.4) that a multi-domain liquid crystal display device comprising:

- first and second substrates (411, 431) being opposite to each other;
- color filter layer (418) having an opening on the first substrate (411) (the opening is a gap between two color filters different from each other);
- first flattening film (420) formed of acrylic resin (see col.8, lines 46-53; Fig.7) that is a insulating material, so that the first flattening film (420) functions as an insulating layer on a entire surface of the first substrate (411) including the color filter (418);
- first alignment film (see col.7, lines 5-7) is deposited on the second flattening film (423), and that also is on the first flattening film (420) (i.e., an alignment film formed on the insulating layer);
- second alignment film (see col.7, lines 8-15) is deposited on the opposite electrode (common electrode 432), and that also is formed on an entire surface of the second substrate (431);
- liquid crystal layer (45) between the first and second substrate (411, 431).

Sakamoto does not explicitly disclose that a protrusion on the second substrate and corresponding to the opening of the first substrate.

However, Song discloses (col.3, line 11-53; Fig.2) that a protrusion (31) is formed on the opening pattern (211), and each color filter (71) has a groove (opening 711), and that corresponds to the opening pattern, such that the protrusion (31) corresponds to the groove (opening 711), and alignment layers formed on the common electrode (81)

Art Unit: 2871

and the pixel electrodes (21) respectively, so that an alignment film also formed on the substrate including the protrusion (31). Song also discloses (col.2, lines 26-28) that forming color filters either at the first substrate or at the second substrate such that each color filter has a groove (such as opening 711) corresponding to the opening pattern, i.e., corresponding to the protrusion (31). Song indicates (col.3, lines 48-50; Fig.2) that the protrusion (31) formed on the opening pattern (211) (corresponding to the groove between the color filters 71, i.e., the opening of the color filter layer) makes it easy to align the liquid crystal molecules (911) as partitioned. Song also indicates (col.1, lines 48-50) that such liquid crystal display achieves a wide viewing angle in simplified processing steps.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange an opening in color filter layer corresponding to a protrusion on a substrate as claimed in claims 1 and 10 for achieving a wide viewing angle in simplified processing steps, i.e., easy to align the liquid crystal molecules as partitioned.

Claims 2, 8, 11 and 19, Sakamoto discloses (Fig.4) that the thin film transistor is formed between the first substrate (411) and the color filter (418), and the first flattening film (420) functions as the insulating layer, the second flattening film (423) functions as the passivation layer, so that the passivation layer including the thin film transistor formed on the insulating layer.

Claims 5 and 13, Sakamoto discloses (col.7, lines 8-15; Fig.4) that the opposed electrode (common electrode 432) is formed on the entire surface of the second

substrate (431), and then a second alignment film is deposited on the opposite electrode (common electrode 432).

Claims 7 and 16, Sakamoto discloses (col.8, lines 46-53; Fig.7C) that using acrylic resin to form the first flattening film (420) (insulating layer), i.e., using acrylic resin to form the insulating layer.

Claims 9 and 20, lacking limitation is such that a black matrix layer between the second substrate and the common electrode.

However, Song discloses (col.4, lines 16-23; Fig.4B) that a black matrix (61) is formed on a second substrate 951) and a common electrode (81) is formed on the black matrix (61), so that the black matrix (61) is between the second substrate (51) and the common electrode (81); and the material of the black matrix (621) is a metallic or opaque material. Therefore, the metallic or opaque material shields the lights, so that such black matrix would prevent the light leakage and increasing the display contrast (such as the applicant admitted prior art indicated in background of the invention of the specification, paragraph 0021 and Fig.2, a black matrix layer 26 preventing light from leaking).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a black matrix as claimed in claims 9 and 20 for preventing the light leakage.

Claim 14, Sakamoto discloses (col.9, lines 21-34) that a liquid crystal are poured into the space between the two substrates that is using injection method to fill the liquid crystal through a pouring hole (inject hole).

Art Unit: 2871

4. Claims 3-4,12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto and as Song applied to claims 1-2,5,7-10,11,13-14,16 and 19-20 above, and further in view of US 6,583,837 (Fukumoto et al).

Claims 3-4,12 and 17, lacking limitation is such that the protrusion has a dielectric structure, and the protrusion is formed of acrylic resin, BCB or black resin; and the insulating layer is formed of acrylic resin, BCB, silicon nitride, silicon oxide or polyimide compound.

However, Song discloses (col.3, lines 1-15;Fig.2) that the protrusion (31) is formed of silicon nitride or organic material (insulating material). Furthermore, Fukumoto discloses (col.5, lines 14-16; Fig.1) that using acrylic resin as the material of the protrusions (25,26,27). Because the dielectric structure is an insulating structure, and acrylic resin having insulating property, so that using acrylic as the material of the protrusion and the insulating layer for achieving the insulating effect.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use acrylic resin as the material of the protrusion and the insulating layer as claimed in claims 3-4,12 and 17 for achieving the insulating effect.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto and as Song applied to claims 1-2,5,7-10,11,13-14,16 and 19-20 above, and further in view of US 5,263,888 (Ishihara et al).

Claim 15, lacking limitation is such that using liquid crystal dropping method such as forming seal, dropping liquid crystal, forming spacer, bonding and hardening the seal pattern.

However, Ishihara discloses (col.4, lines 7-40; col.2, line 58 – col.3, line 51; Fig.3) that using dropping method to assembly a liquid crystal display panel wherein forming a sealing member on a substrate, dropping a liquid crystal material at a surface of a substrate, forming spacer for maintaining a uniform gap between the two substrates (see col.1, lines 30-32), superposing one substrate upon another one substrate (bonding the two substrates), and hardening the sealing member by irradiation with ultra-violet light. Ishihara indicates (col.1, line 49 – col.2, line 2) that using dropping method to fill the space between the two substrates with liquid crystal requires a short time, i.e., performing the assembly of the liquid crystal display panel in a short time.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use dropping method as claimed in claim 15 for achieving a short time to assembly the liquid crystal display panel, i.e., fast to fill the liquid crystal.

Allowable Subject Matter

6. Claims 6 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches that a multi-domain liquid crystal display and a manufacturing method of a multi-domain liquid crystal display comprising various elements and steps, more specifically, as the following:

Art Unit: 2871

the opening (in the color filter) on the first substrate has a pinwheel-shape as shown in Fig.5 [claims 6 and 18].

The closest references such as US 6,650,390 (Sakamoto et al) and US 6,822,723 (Song et al) disclose that the color filter having opening and the opening corresponding to the protrusion so that easy to align the liquid crystal molecules as partitioned. However, non of the prior art of record disclose such opening in the color filter having a pinwheel-shape as claimed.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2871

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi

Mike Qi
Patent Examiner